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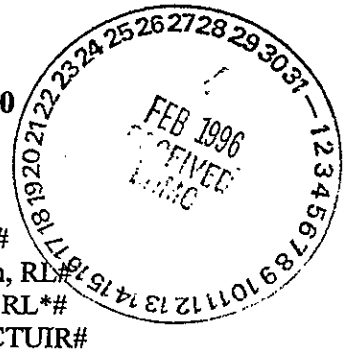
Meeting Minutes
Columbia River Comprehensive Impact Assessment
Weekly Management Meeting
November 7, 1995 - EESB Building, Stampede Room, 1:00 - 4:00



Attendees(*)/Distribution(#):

Jim Becker, PNL*#
Dick Biggerstaff, BHI*#
Amoret Bunn, Dames & Moore*#
Paul Danielson, NPT*#
Greg deBruler, HAB*#
Roger Dirkes, PNL*#
Sue Finch, PNL *#
Larry Gadbois, EPA*#
Stuart Harris, CTUIR*#
Dave Holland, Ecology*#
Nancy Myers, BHI*#
Bruce Napier, PNL*#
Doug Palenshus, Ecology#
Ralph Patt, Oregon*#
Stan Sobczyk, NPT#
Bob Stewart, RL*#
Dan Tano, RL*#
Mike Thompson, RL#
Arlene Tortosa, RL*#
JR Wilkinson, CTUIR#
Tom Woods, YIN*#
Jerry Yokel, Ecology*#
Admin Records-CRCIA#

Summary of Discussions:

Bob Stewart introduced Arlene Tortosa, RL. Arlene attended this meeting to provide the management team with results that were recently obtained as part of the Columbia River Substrate Pore Water Sampling Program. A draft map of sampling locations and a preliminary draft results table were handed out and are attached to these meeting minutes. The samples from locations TD38A, TD39A, TD41A, and TD42A had higher than anticipated levels of hexavalent chromium (630 ppb). The "A" locations are near shore sampling points and correspond to 5 foot water depths at the 60,000 cfs river flow rate. The "B" locations are further out in the river at the 10 foot depth. Results from B locations are not in yet with the exception of locations TD39B and TD40B which both had nondetects.

In an effort to understand the source of the chromium concentrations, program staff are looking at the DR process sewer outfall structure which is located opposite the TD39 location. This is of historical significance as this is the location of a process sewer outfall that no longer exists. Photos were shown of the area when the outfall was in place and also as it looks today. It is not known if the process sewer outfall was removed or just buried over. Staff have determined that the process sewer handled all non-rad effluent from the facilities. Concentrated sodium dichromate overflowed from open top tanks discharged to the pad and then to process sewer system which discharged to the river. This information has been brought to light as a result of investigating the source of the chromium. There also appears to be an upstream storm water discharge outlet. No drawings have been found for this structure. It is also possible that a groundwater plume could be contributing to the detected chromium levels but there are no wells in this area to evaluate this.

The question, "where is the closest well?" was asked. It is located immediately down gradient from a burial ground and is located at the point 199 D2-6 on the map. The question, "where are wells proposed for 100HR3 going to be on this map?", was asked and the response was "centered around the island area of the shoreline". The question, "how far out can you go from the current river line?" was asked. If out near the center of the river, that scope goes beyond this program and gets into the characterization program. Current information indicates the discharge is closer to shore rather than out in the middle of the river. At station TD39A, there were large quantities of filter back wash material from the coolant water treatment facility such as black carbon and accumulated sand. Staff are pretty confident that the concentrations flow into the soil and are contained in a localized region. Also, staff are working to get a handle on what other constituents could reasonably be expected. It was noted that it would be helpful to see plumes on this map; this is a task that is planned and should be done by the end of the week.

It was emphasized that this is all current field information and it was being shared with the project management

team as soon as it was available. Not all analysis and conclusions are complete.

An action was assigned to Dick Biggerstaff to arrange for a briefing on the river pipes project by Tom Brown or Susan Wilson for the 11/14/95 weekly meeting.

Comments on prior meeting minutes were asked for. On the 11/7/95 minutes, page 3, paragraph 4, delete *Ishmale* and replace with *Ishmael*. Other comments will be given to Sue outside of the meeting and included in future meeting minutes.

A revised schedule, dated 11/06/95, was handed out. The schedule was compressed to complete all FY96 activities by 9/30/96 without changing the scope. Meeting dates were confirmed with task leaders and presented to the management team as page 1 of the schedule. One additional meeting will be scheduled for Wednesday, January 17, from 9:00 to noon. It was noted that December 26 falls on a holiday. Additionally, the meeting scheduled for January 2, 1996 was canceled.

An action was assigned to Sue Finch to try to locate larger meeting rooms for the weeks that presentations will be held.

Ralph Patt discussed with Marilynn Reeves the idea of having the HAB pay to bring in an outside consultant to the weekly management meetings and received a positive response. If Ralph needs a letter from RL, Bob will write one. Ralph will let the team know what is needed. Additionally, this effort will be coordinated with the tribal representatives.

An updated contact list with PNL task leaders added was handed out. Additionally, a report distribution list was handed out for mark up by team members to ensure the correct representatives receive the reports when they are published.

Nancy Myers had an action to draft an article for publication in the *Hanford Update* and bring it to today's meeting. After checking on the schedule, the *Hanford Update* was mailed last week and another issue will not go out until January. An article will be prepared for the January issue. The intent was to announce that the Contaminants of Concern (COC) report will be going out for technical peer review and that the public can still comment on the report. Since the *Hanford Update* will not be published until January and a letter had gone to the public when the COC report was published in January 1995, it was agreed that no specific letter on the COC report would go out again. Comments will be accepted until January 17, 1996.

A revised statement of work for the technical peer reviewers has gone to the directors for comments. This can be shared at the next meeting if there is an interest. None was raised.

Bruce Napier was introduced to give a presentation on the Contaminants of Concern report. The view graphs used during this presentation are attached to these meeting minutes. The bullets below summarize the discussion and capture the items/questions that were raised during the presentation.

- Rationale for COC work - Identify the problems, then limit, and spend resources on a few items. This raised the question of looking at a broader spectrum and limiting the depth of each contaminant review. The main list is over 100 contaminants that has been narrowed down to 30 through screening. In almost all assessments, one or two items control the majority of risk. Tried to capture that in a scoping sense to get 90% of the risk. Point raised that we need to be aware of narrow contaminant focus; there are other factors outside of the current risk assessment. The discussion of few, detailed assessments versus broad brush approach was discussed and agreed to at a meeting 3 or 4 weeks ago.

- Spatial Coverage - When this work was done, the interest in the project was the Columbia River

and its sources all the way to the ocean. Study included soils near the river within 500 feet; further away was considered groundwater; excluded buildings, tank farms, etc. Focus of the report is current as defined as in the river or about to be in the river. Does not include the vadose zone further than 500 feet from the river.

- The COC report is the initial product of the study. The remainder of the study will use this COC list. The COC is the funnel.

- Data Sources - Tried to focus to get good traceable information. Looked at recent sampling reports, primarily since 1980. During that time (1980), along with BWIP, quality assurance became a big deal at Hanford. Used all data that was found with a few exceptions and those exceptions are flagged in the report. Data was not limited to post-1980.

- Substances Looked For and Found - In the past 15 years, at one time or another, about 600 different substances in surface water and sediments have been looked for. Of these, about 100 have been found. Many substances are at the background level. Comments were received to move the information on background levels from the back of the report to a more visible location. Since the publication of the COC report, BHI has published a report on background levels. Bruce has a copy of the report and will use this information in finalizing the COC section of the final report. When looking at what we know happened in the late 40's, are substances gone or maybe not gone, perhaps behind the dams, etc.; would filters have found those? If there was a detectable quantity, then substances should have shown up. Some isotopes may have changed, i.e., neptunium is now plutonium. Process being used gets the current status of the river; can't tell if the river was changed by past operations. Data outside of Hanford was used, included data from George Toomes and Doug Wells.

- Screening Approach - Used specific screens for human risk and ecological risk as described in the view graphs. The question, "how does fish consumption of 100 kilograms/year fit into the traditional tribal diet?" was asked of tribal representatives at the table. Stuart Harris responded that he has personally eaten up to 150 pounds this year; however, he's not typical, he's on the low end.

- The questions, "how do you handle combined effects? where does screening come in?", were asked. Currently, the only way to account for synergistic effects is to multiply each individually. The objective was to get the most risk.

- Ecological Risk Screening - At time the document was prepared, used EPA ambient water quality criterion and filled in with aquatic biota toxicity screen. Since publication of COC report, more information is available. Jerry Yokel provided Bruce with a copy of "Summary of Guidelines for Contaminated Freshwater Sediments", March 1995, 95-308 which contains information that the state is now using. Jerry took the action to bring extra copies of this report to the 11/14/95 meeting.

- When screening, if any substance met any positive criteria, it is on the COC list.

- Groundwater - Need to look at localized effects where COC's come in to the river. This is not in the current report and is a major comment and change to the report before it is finalized. However, the report as it stands is going to peer reviewers. Discussion at last meeting was to send comments received without any resolution to peer reviewers. Based on this discussion, agreement was reached to send comments plus disposition of comments that result in a significant change to the document to the technical peer reviewers.

- The question, "if using dilutions for the solution to the problem, where does dispersion come

in?", was asked. This leads to the starting point for the screen for seeps and springs. Need something that is intermediate between groundwater and intermixing. Contaminants come out of the ground, into the river, mixing slowly, if at all. The concern was raised that the contaminant may have detrimental localized effect but may fall off the screening charts once in the river and diluted. After much discussion, it was determined that rather than call the scenario a "seeps and springs screen", it should be referred to as a "localized effects scenario". Agreed that this needs to be resolved but we don't have the equation yet. Action was taken to schedule a presentation to this group when the equation is developed. Also need to look at contaminants that are soluble in water.

- The question, "how do we disperse things into the river that are not soluble?", was asked. Comments that this is circular path that goes back to the seeps and springs; discharge from the gravel, not just seeps and springs; includes upwelling. This discussion again led to the need for a localized effects scenario.

- Other Potential Hazards Evaluated - Discrete particles have been found at D island and down at Snake River confluents. This information is in the COC report as chapters. Same thing for direct irradiation from facilities, places that report dose rates above background. Need to deal with high dose rates from specific meters at 100N. Also need to look at materials that may not make the list because of dose rate but are high in the public interest.

- Contaminants of Interest Identified to Date - Why is uranium not on the list? Because of dilution factor. By looking at localized effects, we may add some contaminants to the list but we don't know what they are yet. The localized scenario may move a contaminant from one column to another.

- A comment was received to add irrigation/crop consumption to the human screen, referring to the current pathway on the Pasco side of the river. Irrigation return is a significant factor to water quality. The SES Program does not routinely analyze ditch returns but the impacts can be seen in the cross section a mile downstream.

- Another comment received was to include impacts on fish eggs. Since publication, suggested references have been received.

An action was assigned to Sue Finch to obtain a copy of "Qualitative Risk Assessment for 100KR4" regarding Carbon 14 and to pass on the copy to Bruce Napier.

Comprehensive Chapter:

- Vadose zone.
- Affect on the river from the various remediation efforts ongoing around the site or are projected to go on around the site, including solid waste burial grounds.
- Synergistic and combined effects.

Agreements:

- Send comments on the COC report plus disposition of comments that result in a significant change to the document to the technical peer reviewers. This agreement is a change to the agreement in a prior meeting.

Action Items:

Action Description	Assigned To	Due Date
Arrange a briefing on the river pipes project for the 11/14/95 weekly meeting	Dick Biggerstaff	11/14/95
Locate larger meeting rooms for the weeks that presentations will be held	Sue Finch	11/14/95
Review and mark up report distribution list.	All team members	ASAP
Bring copies of "Summary of Guidelines for Contaminated Freshwater Sediments" to next meeting	Jerry Yokel	11/14/95
Schedule a presentation to this group when the equation for the localized effects scenario is developed.	Bruce Napier/Sue Finch	ASAP
Obtain a copy of "Qualitative Risk Assessment for 100KR4" regarding Carbon 14 and pass on the copy to Bruce Napier	Sue Finch	ASAP

Date/Location of Next 2 Scheduled Meetings:

- Tuesday, November 14, 1:00 - 4:00, EESB Building, Stampede Room
- Tuesday, November 21, 1:00 - 4:00, EESB Building, Stampede Room (May change if larger room is located.)

Attachments:

- 11/07/95 meeting agenda (original)
- 11/07/95 revised meeting agenda
- Preliminary River Substrate Sampling Results Map
- Pore Water Samples: Preliminary Results Table (Updated 11/07/95)
- Project schedule dated 11/06/96
- Updated contact list
- Report distribution list for mark-up
- Identifying Contaminants of Concern, presentation by Bruce Napier

Prepared by SM Finch on 11/13/95

AGENDA
Columbia River Comprehensive Impact Assessment
Weekly Project Management Team

Scheduled from 1:00 - 4:00 p.m., November 7, 1995
Battelle's EESB Building, Stampede Room

1. Review of Meeting Minutes - Sue Finch

2. Draft Article for Hanford Update - Nancy Myers

3. Contaminants of Concern Review - Bruce Napier

REVISED AGENDA
Columbia River Comprehensive Impact Assessment
Weekly Project Management Team

Scheduled from 1:00 - 4:00 p.m., November 7, 1995
Battelle's EESB Building, Stampede Room

1. 100-D Chromium - Arlene Tortosa
2. Review of Meeting Minutes - Sue Finch
3. Draft Article for Hanford Update - Nancy Myers
4. Contaminants of Concern Review - Bruce Napier

DRAFT

PRELIMINARY RIVER SUBSTRATE SAMPLING RESULTS

- Transect numbers are abbreviated (e.g. "43" = "TD43A"). Samples collected at approximately 5 and 10-foot water depths, with river stage at 63,000 cfs. Transect locations are approximate. Dashed shoreline represents low river stage.
- Circled values are hexavalent chromium results reported by PNNL for sampling through 11/03/95. Analysis method used is Adsorptive Stripping Voltametry. Samples were filtered prior to analysis.
- Where no values are plotted, results were below detection.

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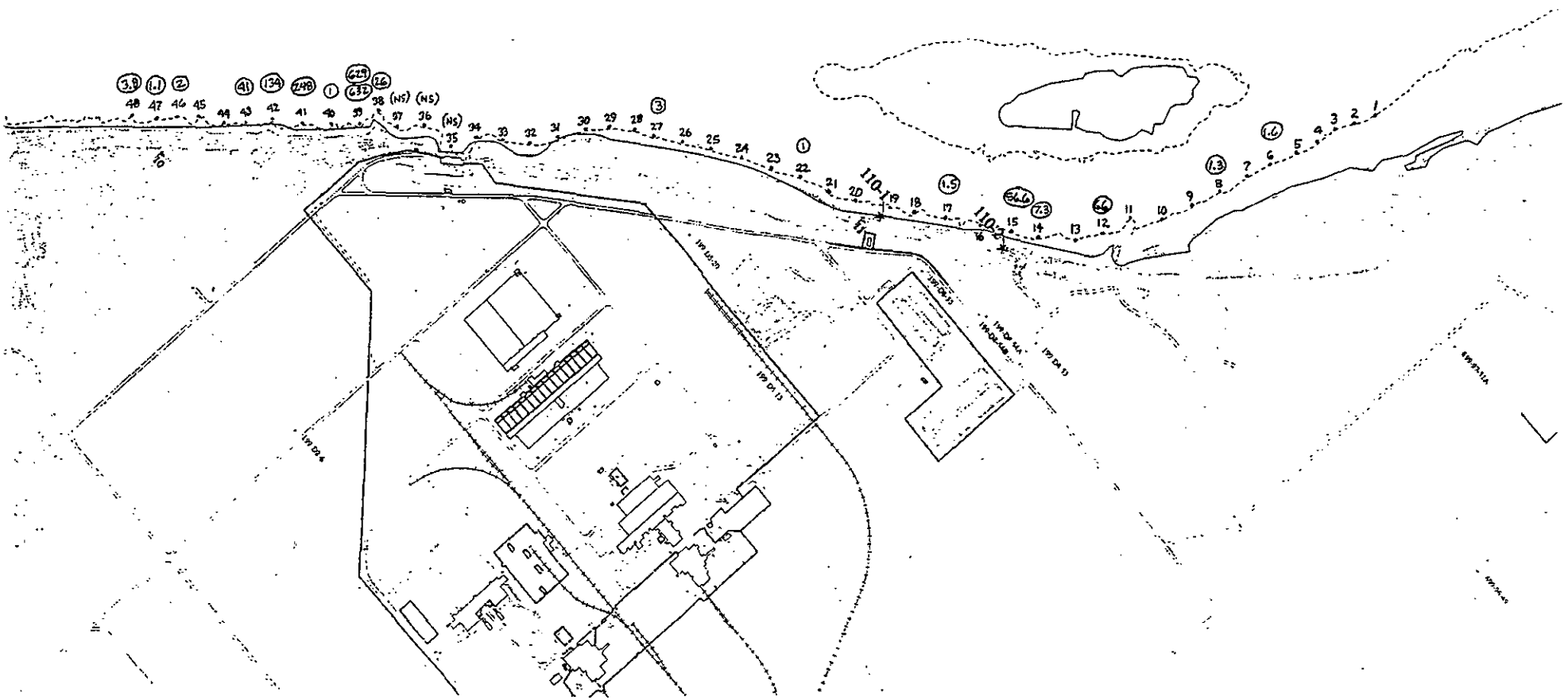

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PORE WATER SAMPLES: PRELIMINARY RESULTS TABLE (Updated 11/07/95)

Sample Date	Transect Identifier (100-D/DR)	Hexavalent Chromium (ppb)
95-10-17	TD01A	< 1
95-10-17	TD02A	< 1
95-10-17	TD03A	< 1
95-10-19	TD05A	< 1
95-10-19	TD06A	1.6
95-10-19	TD07A	< 1
95-10-19	TD08A	1.3
95-10-19	TD09A	< 1
95-10-22	TD10A	< 1
95-10-22	TD11A	< 0.5
95-10-22	TD12A	66
95-10-22	TD13A	< 0.5
95-10-22	TD13A	< 0.5
95-10-22	TD14A	7.3
95-10-27	TD15A	56.6
95-10-27	TD16A	< 0.5
95-10-27	TD17A	1.5
95-10-27	TD18A	< 0.5
95-10-27	TD18A	< 0.5
95-10-28	TD19A	< 0.5
95-10-28	TD20A	< 0.5
95-10-28	TD21A	< 0.5
95-10-28	TD22A	1
95-10-28	TD23A	< 0.5
95-10-28	TD24A	< 0.5
95-10-29	TD25A	< 0.5
95-10-29	TD26A	< 0.5
95-10-29	TD27A	3
95-10-29	TD28A	< 0.5
95-10-29	TD29A	< 0.5
95-10-29	TD30A	< 0.5
95-10-31	TD33A	< 0.5
95-10-31	TD34A	< 0.5
95-11-01	TD38A	26
95-11-01	TD39A	632
95-11-01	TD39A	629
95-11-01	TD40A	1
95-11-01	TD41A	248
95-11-01	TD42A	134
95-11-01	TD43A	41
95-11-03	TD40B	< 0.5
95-11-03	TD39B	< 0.5
95-11-03	TD46A	2
95-11-03	TD47A	1.1
95-11-03	TD48A	3.8

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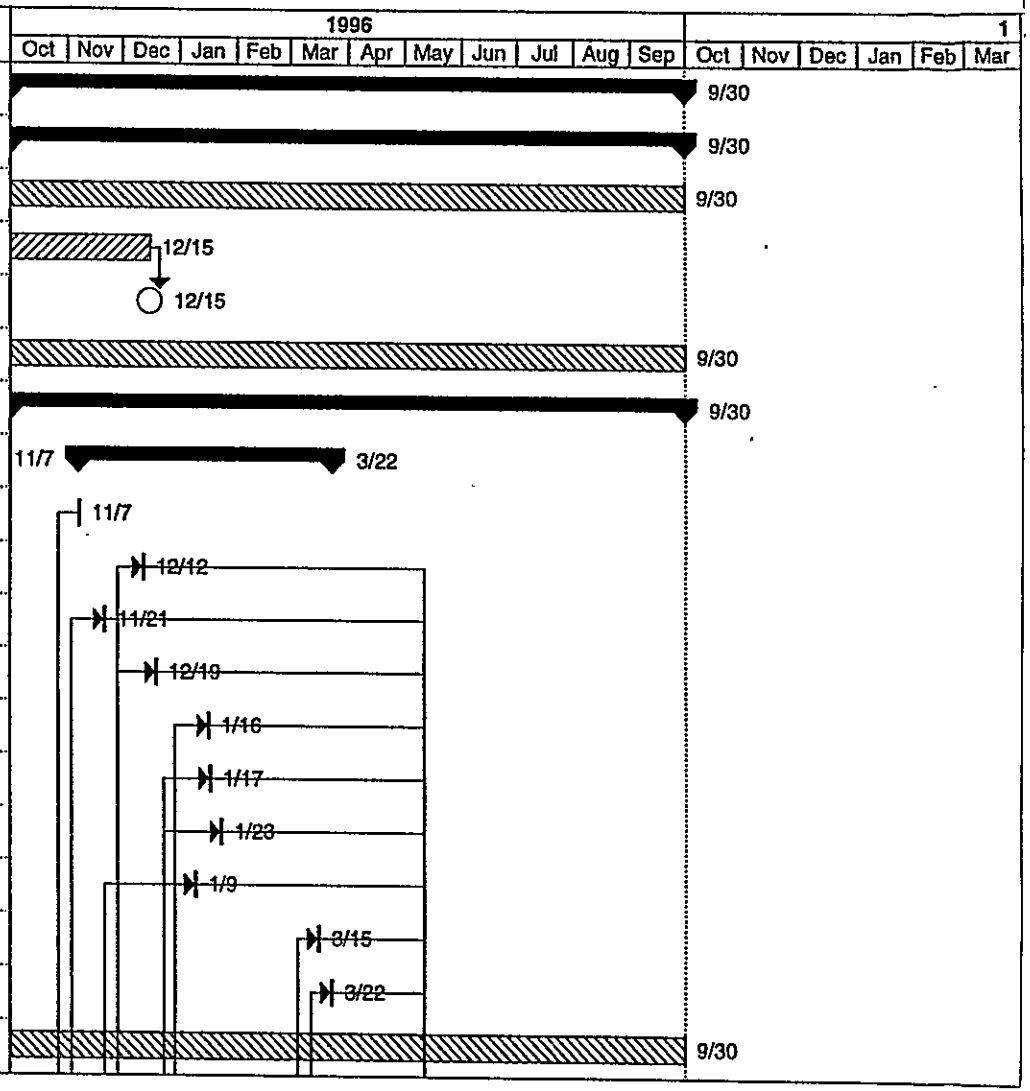
ID	WBS	Title
1	1.4.10.1.1.08.07.1.03	Columbia River Comprehensive Impact Assessment (CRCIA)
2	1.4.10.1.1.08.07.1.03.01	Project Management
3	1.4.10.1.1.08.07.1.03.0101	Planning and Control
4	1.4.10.1.1.08.07.1.03.0102	FY96 Work Plan
5	1.4.10.1.1.08.07.1.03.0102-M	TPA Milestone M-15-80: Determine the date for submitting CRCIA to Tri-Parties
6	1.4.10.1.1.08.07.1.03.0103	QA and Records Management
7	1.4.10.1.1.08.07.1.03.02	Technical Integration & Coordination
8	1.4.10.1.1.08.07.1.03.0201	Technical Scoping Meetings
9	1.4.10.1.1.08.07.1.03.020101	Contaminants of Concern: BA Napier
10	1.4.10.1.1.08.07.1.03.020102	Scenarios- HH - Select Populations; Characterize Diets: BA Napier
11	1.4.10.1.1.08.07.1.03.020104	Conceptual Exposure Model - Eco: CA Brandt
12	1.4.10.1.1.08.07.1.03.020105	Ecosystem Conceptual Model: CA Brandt
13	1.4.10.1.1.08.07.1.03.020106	Species of Concern: CA Brandt
14	1.4.10.1.1.08.07.1.03.020107	Evaluate Alternative Exposure Models - Mtg 1: CA Brandt
15	1.4.10.1.1.08.07.1.03.020108	Evaluate Alternative Exposure Models - Mtg 2, if needed: CA Brandt
16	1.4.10.1.1.08.07.1.03.020109	Source Term Data - Human Health and Ecological: TB Miley
17	1.4.10.1.1.08.07.1.03.020110	EHQs - Ecol: CA Brandt
18	1.4.10.1.1.08.07.1.03.020111	Population Modeling - Eco: CA Brandt
19	1.4.10.1.1.08.07.1.03.0202	Weekly Management Meetings



Project Manager: RL Dirkes Rev. #: 1 Date: 11/6/95
PNL Approval: Date:
DOE-RL Approval: Date:

Critical
Noncritical
Summary
Milestone-PNL Key
Rolled Up
Milestone-RL
Milestone-HQ
Milestone-Contractor
Milestone-TPA

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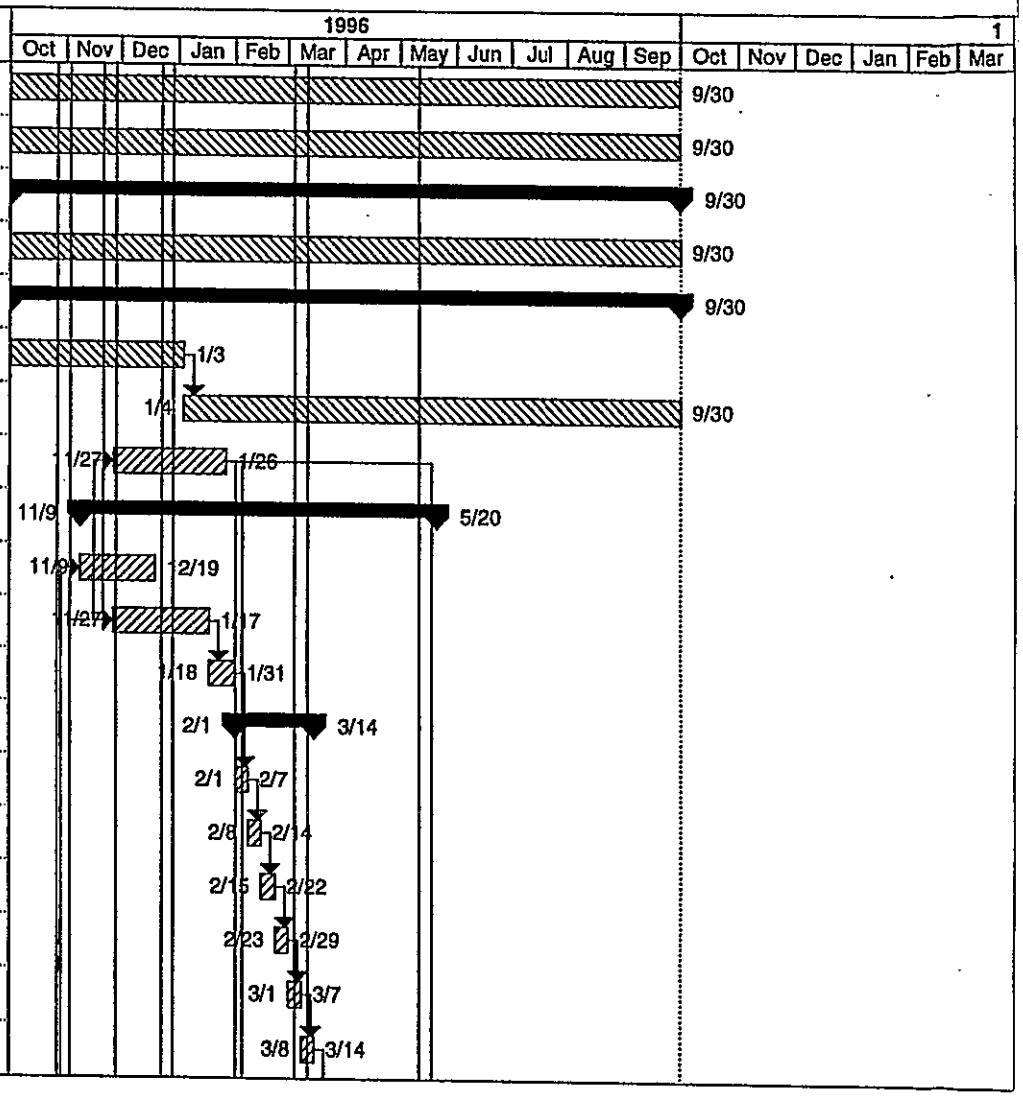
ID	WBS	Title
20	1.4.10.1.1.08.07.1.03.0203	RL/PNL/EPA/Ecology/Native Americans/Oregon/HAB/BHI/WHC Interaction
21	1.4.10.1.1.08.07.1.03.0204	Public Involvement (BHI/Ecology)
22	1.4.10.1.1.08.07.1.03.03	Data Management
23	1.4.10.1.1.08.07.1.03.0301	Columbia River Reference Database (CRRD) Update and Maintenance
24	1.4.10.1.1.08.07.1.03.0302	Document/Data Accessibility
25	1.4.10.1.1.08.07.1.03.030201	Appendix A Documents to the Reading Room
26	1.4.10.1.1.08.07.1.03.030202	Ongoing Low Level Support
27	1.4.10.1.1.08.07.1.03.0302	Numerical Database (Appendices in Final Report)
28	1.4.10.1.1.08.07.1.03.0303	Human Health and Ecological Source Term Data Report (100 pages)
29	1.4.10.1.1.08.07.1.03.030301	Define Source Term Data Needs and DQOs
30	1.4.10.1.1.08.07.1.03.030302	Source Term Data Assembly
31	1.4.10.1.1.08.07.1.03.030303	Author/Editor Prepare Draft Source Term Rpt, including Comprehensive Section
32	1.4.10.1.1.08.07.1.03.030304	Document Production (Draft)
33	1.4.10.1.1.08.07.1.03.03030401	Internal Review
34	1.4.10.1.1.08.07.1.03.03030402	Comment Resolution
35	1.4.10.1.1.08.07.1.03.03030403	Initial Edit
36	1.4.10.1.1.08.07.1.03.03030404	Author Resolution
37	1.4.10.1.1.08.07.1.03.03030405	Text Processing Corrections
38	1.4.10.1.1.08.07.1.03.03030406	Duplicating/Distribution



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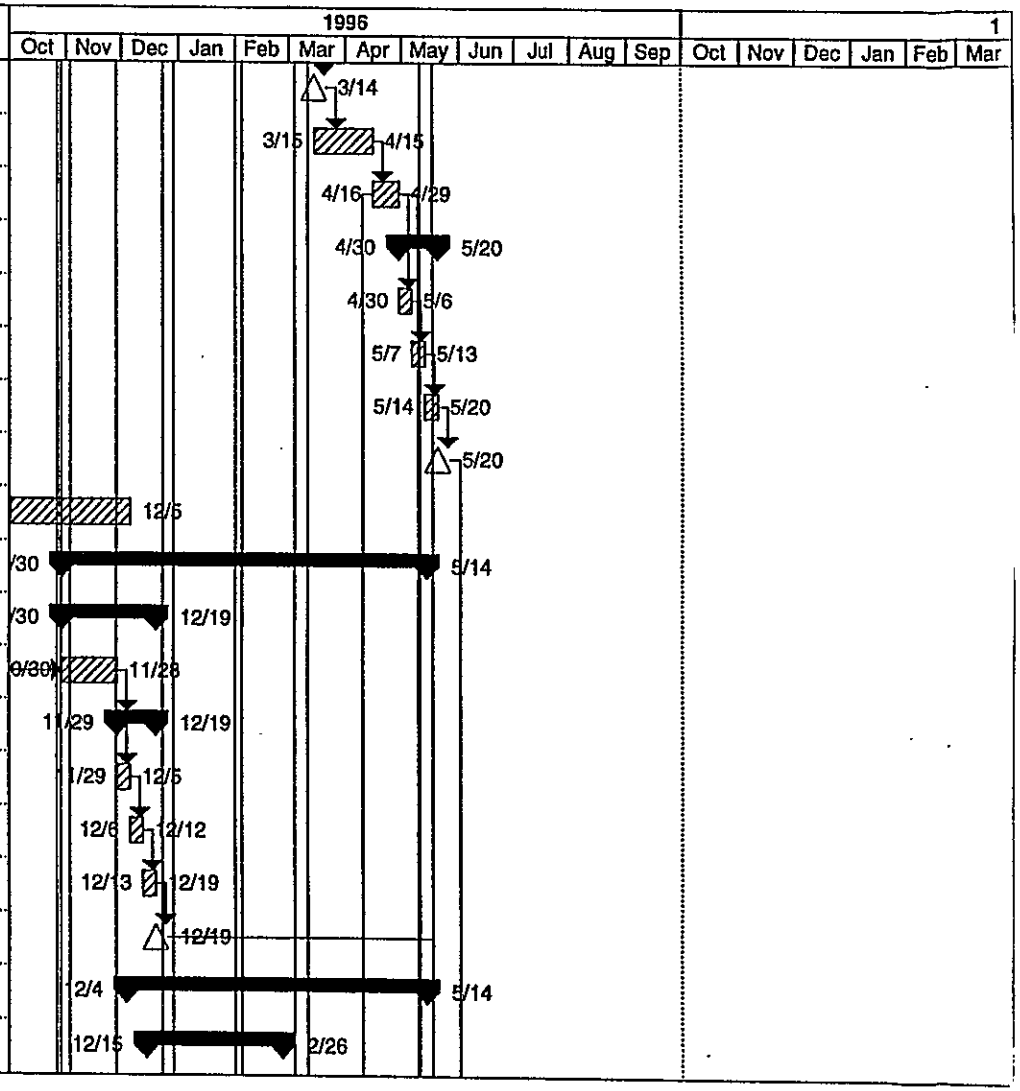
ID	WBS	Title
39	1.4.10.1.1.08.07.1.03.030304-M	21309:01 - Publish Draft HH and Eco Source Term Report
40	1.4.10.1.1.08.07.1.03.030305	Public/Peer Review Period
41	1.4.10.1.1.08.07.1.03.030306	Address Comments from Draft Source Term Report
42	1.4.10.1.1.08.07.1.03.030307	Document Production (Final)
43	1.4.10.1.1.08.07.1.03.03030701	Final Edit
44	1.4.10.1.1.08.07.1.03.03030702	Author Resolution
45	1.4.10.1.1.08.07.1.03.03030703	Text Processing
46	1.4.10.1.1.08.07.1.03.030308	Incorporate Source Term Into Final Report
47	1.4.10.1.1.08.07.1.03.0304	Sediment Data Report
48	1.4.10.1.1.08.07.1.03.04	Scoping Level Risk Assessment
49	1.4.10.1.1.08.07.1.03.0401	Preface/Site Characterization
50	1.4.10.1.1.08.07.1.03.040101	Prepare Chapter
51	1.4.10.1.1.08.07.1.03.040101	Document Production (Final)
52	1.4.10.1.1.08.07.1.03.040101	Final Edit
53	1.4.10.1.1.08.07.1.03.040101	Author Resolution
54	1.4.10.1.1.08.07.1.03.040101	Text Processing
55	1.4.10.1.1.08.07.1.03.040102	Incorporate Site Char. Into Final Report
56	1.4.10.1.1.08.07.1.03.0402	Human Health (HH)
57	1.4.10.1.1.08.07.1.03.040201	Contaminants of Concern (100 pages)



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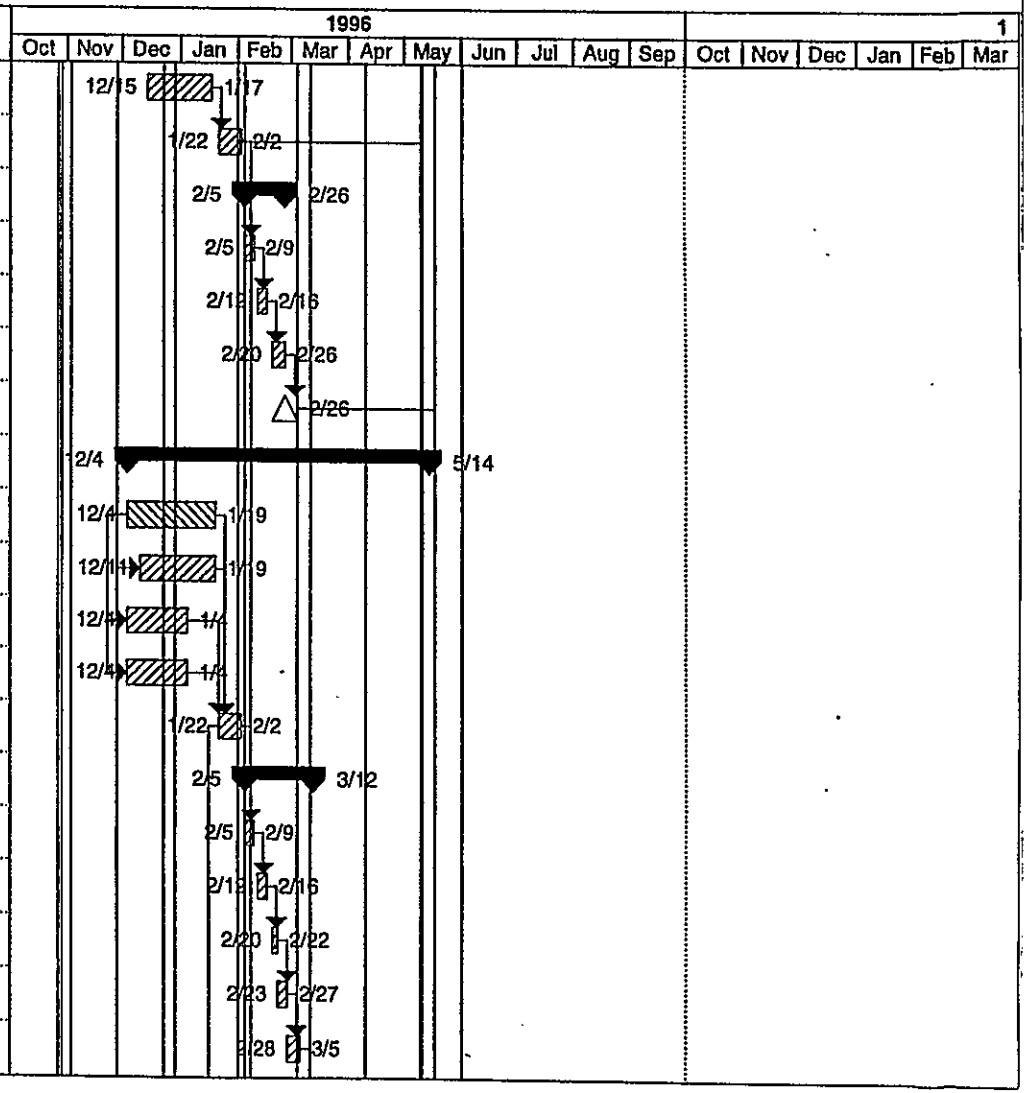
ID	WBS	Title
58	1.4.10.1.1.08.07.1.03. 04020102	Public/Peer Review Period
59	1.4.10.1.1.08.07.1.03. 04020103	Address Comments from Draft COC Report
60	1.4.10.1.1.08.07.1.03. 040101	Document Production (Final)
61	1.4.10.1.1.08.07.1.03. 040101	Final Edit
62	1.4.10.1.1.08.07.1.03. 040101	Author Resolution
63	1.4.10.1.1.08.07.1.03. 040101	Text Processing
64	1.4.10.1.1.08.07.1.03. 04020104	Incorporate COC into Final Report
65	1.4.10.1.1.08.07.1.03. 040202	Scenarios (50 pages)
66	1.4.10.1.1.08.07.1.03. 04020201	Describe the Food Chain/Food Web
67	1.4.10.1.1.08.07.1.03. 04020202	Assessment of Biotransfers of Radionuclides through Food Webs
68	1.4.10.1.1.08.07.1.03. 04020203	Select Representative Potentially-Exposed Populations
69	1.4.10.1.1.08.07.1.03. 04020204	Characterize Diets
70	1.4.10.1.1.08.07.1.03. 04020205	Author/Editor Prepare Draft Scenarios Rpt, Including Comprehensive Section
71	1.4.10.1.1.08.07.1.03. 04020206	Document Production (Draft)
72	1.4.10.1.1.08.07.1.03. 0402020601	Internal Review
73	1.4.10.1.1.08.07.1.03. 0402020602	Comment Resolution
74	1.4.10.1.1.08.07.1.03. 0402020603	Initial Edit
75	1.4.10.1.1.08.07.1.03. 0402020604	Author Resolution
76	1.4.10.1.1.08.07.1.03. 0402020605	Text Processing Corrections



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Milestone-Contractor
Milestone-TPA

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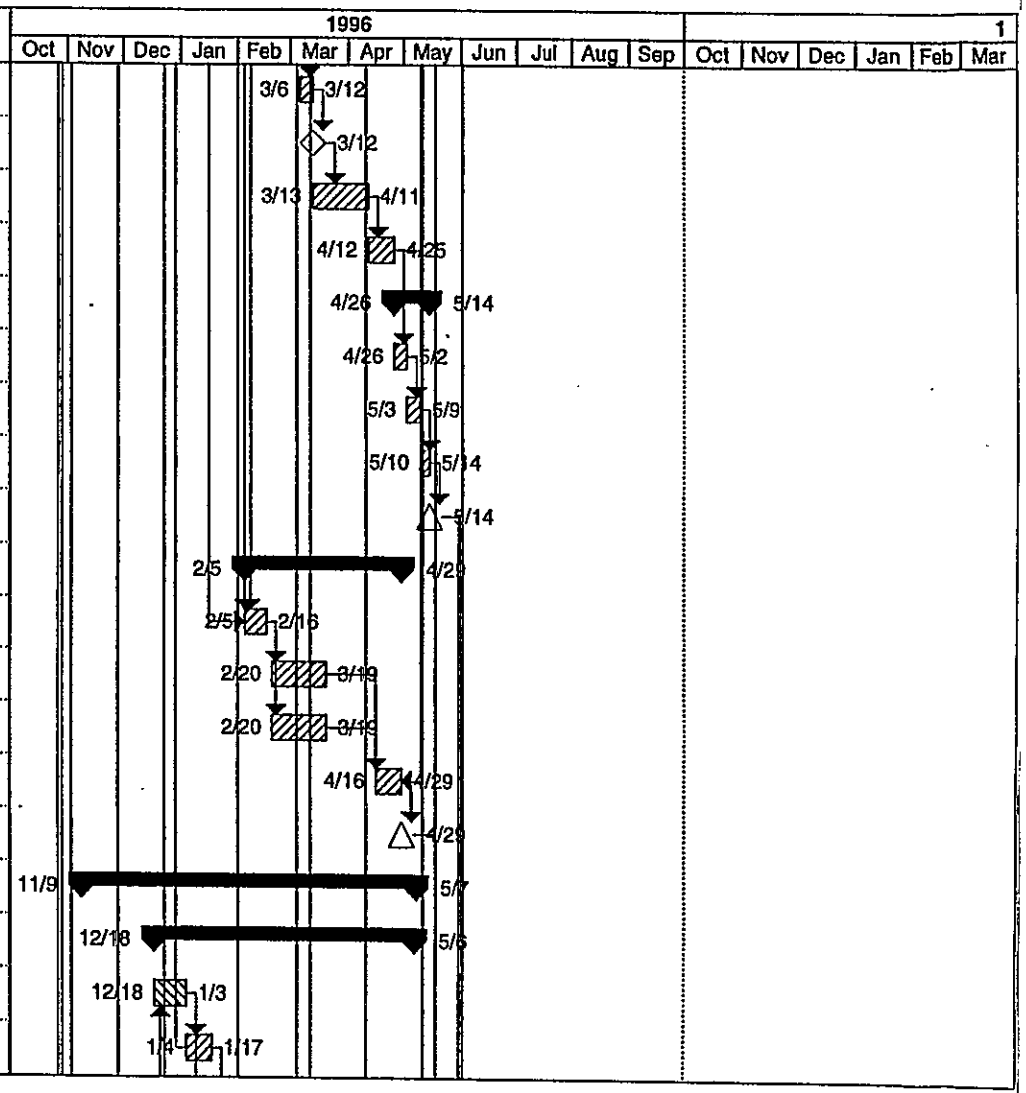
82	1.4.10.1.1.08.07.1.03. 0402020901	Final Edit
83	1.4.10.1.1.08.07.1.03. 0402020902	Author Resolution
84	1.4.10.1.1.08.07.1.03. 0402020903	Text Processing
85	1.4.10.1.1.08.07.1.03. 04020210	Incorporate Scenarios into Final Report
86	1.4.10.1.1.08.07.1.03. 040203	Human Health Scoping Level Risk Assessment
87	1.4.10.1.1.08.07.1.03. 04020301	Compute Doses
88	1.4.10.1.1.08.07.1.03. 04020302	Uncertainty/Sensitivity Analyses
89	1.4.10.1.1.08.07.1.03. 04020303	Validation
90	1.4.10.1.1.08.07.1.03. 04020304	Author/Editor Prepare Draft HH Scoping Level Risk Assessment, Including Comprehensive
91	1.4.10.1.1.08.07.1.03. 04020305	Incorporate Draft HH Scoping Level Risk Assessment into Final Report
92	1.4.10.1.1.08.07.1.03. 0403	Ecological
93	1.4.10.1.1.08.07.1.03. 040301	Species of Concern (100 pages)
94	1.4.10.1.1.08.07.1.03. 04030101	Define Key Receptors
95	1.4.10.1.1.08.07.1.03. 04030102	Author/Editor Prepare Draft Species of Concern Rpt, Including Comprehensive Section



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98	1.4.10.1.1.08.07.1.03. 0403010302	Comment Resolution
99	1.4.10.1.1.08.07.1.03. 0403010303	Initial Edit
100	1.4.10.1.1.08.07.1.03. 0403010304	Author Resolution
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104	1.4.10.1.1.08.07.1.03. 04030104	Public/Peer Review Period
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108	1.4.10.1.1.08.07.1.03. 0403010602	Author Resolution
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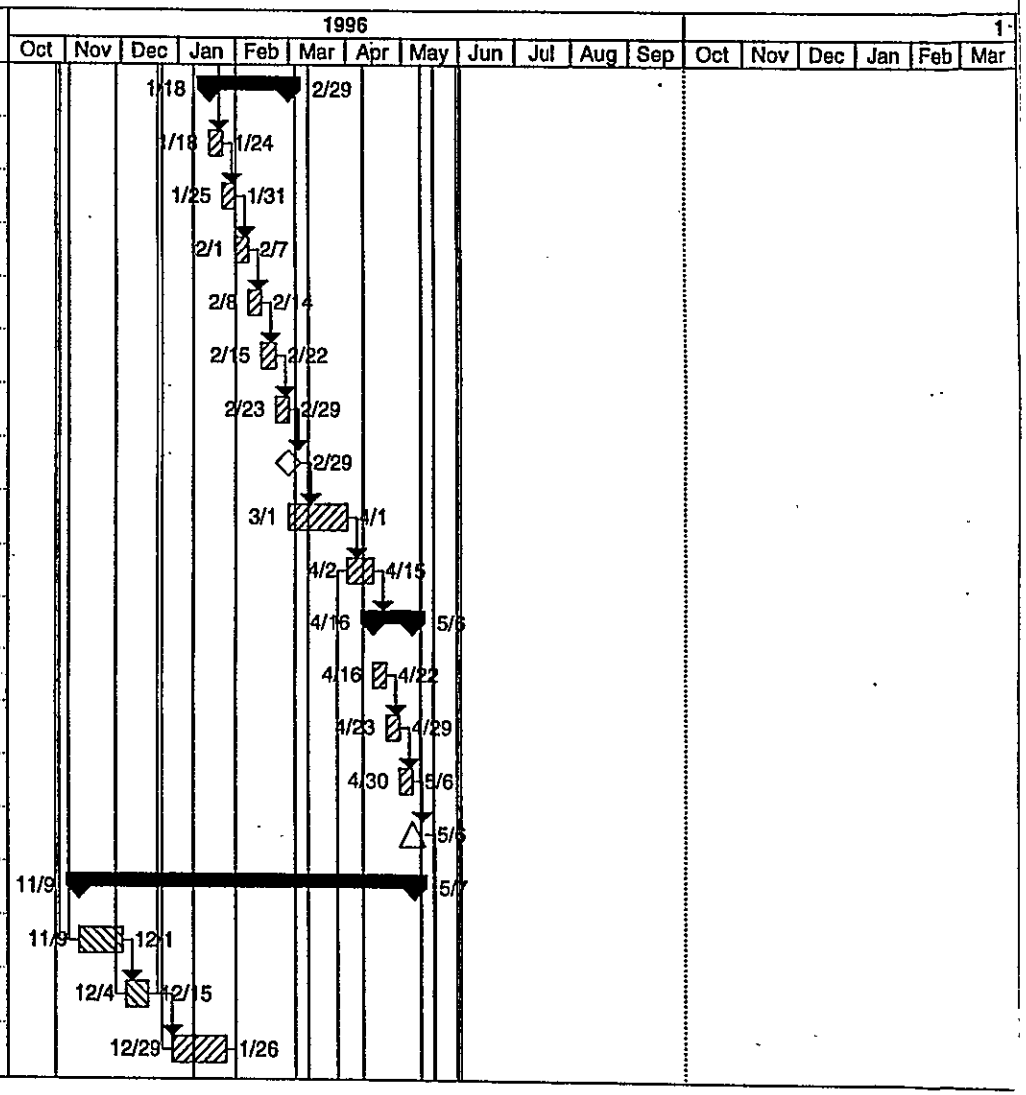
110	1.4.10.1.1.08.07.1.03. 04030107	Incorporate Species of Concern into Final Report
111	1.4.10.1.1.08.07.1.03. 040302	Exposure Risk Assessment
112	1.4.10.1.1.08.07.1.03. 04030201	Develop Conceptual Exposure Model
113	1.4.10.1.1.08.07.1.03. 04030202	Develop Ecosystem Conceptual Model
114	1.4.10.1.1.08.07.1.03. 04030203	Evaluate Alternative Exposure Models



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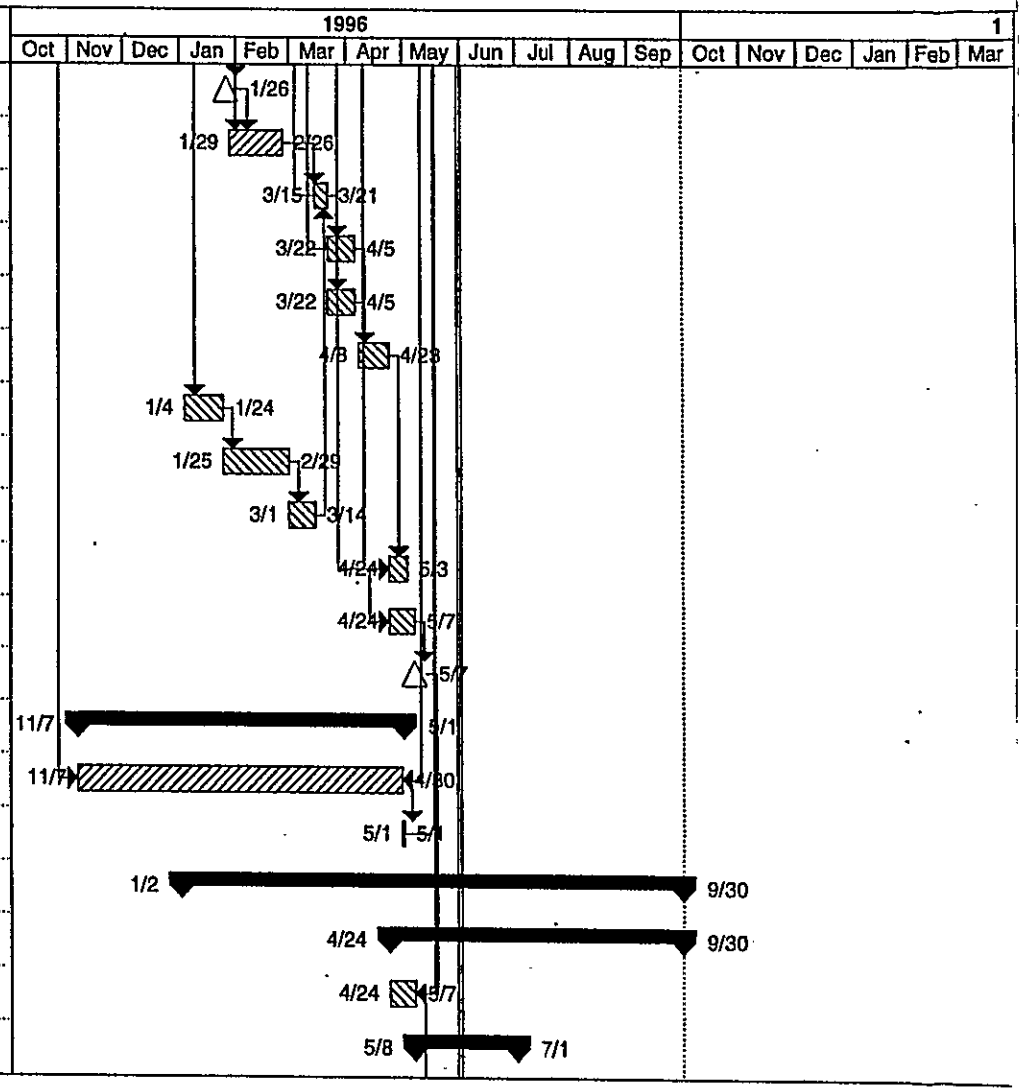
115	1.4.10.1.1.08.07.1.03.04030204	Select Exposure Models
116	1.4.10.1.1.08.07.1.03.04030205	Model Exposure
117	1.4.10.1.1.08.07.1.03.04030206	Estimate EHQs
118	1.4.10.1.1.08.07.1.03.04030207	Estimate Population-Level Effects
119	1.4.10.1.1.08.07.1.03.04030208	Model/Estimate Spatial EHQs
120	1.4.10.1.1.08.07.1.03.04030209	Conduct Uncertainty Analysis
121	1.4.10.1.1.08.07.1.03.04030210	Define Endpoints
122	1.4.10.1.1.08.07.1.03.04030211	Assemble Toxicological Databases
123	1.4.10.1.1.08.07.1.03.04030212	Assemble Endpoint Reference Database
124	1.4.10.1.1.08.07.1.03.04030213	Revise Risk Assessment as Necessary
125	1.4.10.1.1.08.07.1.03.04030214	Author/Editor Prepare Draft Eco Scoping Level Risk Assessment, Including Comprehensive
126	1.4.10.1.1.08.07.1.03.04030215	Incorporate Draft Eco Scoping Level Risk Assessment Into Final Report
127	1.4.10.1.1.08.07.1.03.05	Compilation of Comprehensive Assessment
128	1.4.10.1.1.08.07.1.03.0501	Prepare Comprehensive Assessment Chapter
129	1.4.10.1.1.08.07.1.03.0502	Incorporate Comprehensive Assessment Chapter Into Final Report
130	1.4.10.1.1.08.07.1.03.06	Final Report/Information Utilization
131	1.4.10.1.1.08.07.1.03.0601	Complete Final Scoping Level Risk Assessment Report
132	1.4.10.1.1.08.07.1.03.060101	Consolidate Chapter Inputs
133	1.4.10.1.1.08.07.1.03.060102	Document Production (Draft)



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136	1.4.10.1.1.08.07.1.03. 06010201	Text Processing (SLRA's, TOC, Page #s, etc.)
137	1.4.10.1.1.08.07.1.03. 06010202	Internal Review (Whole Document)
138	1.4.10.1.1.08.07.1.03. 06010203	Comment Resolution
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144	1.4.10.1.1.08.07.1.03. 060104	Address Comments from Draft Scoping Level Risk Assessment
145		Final Edit
146		Author Resolution
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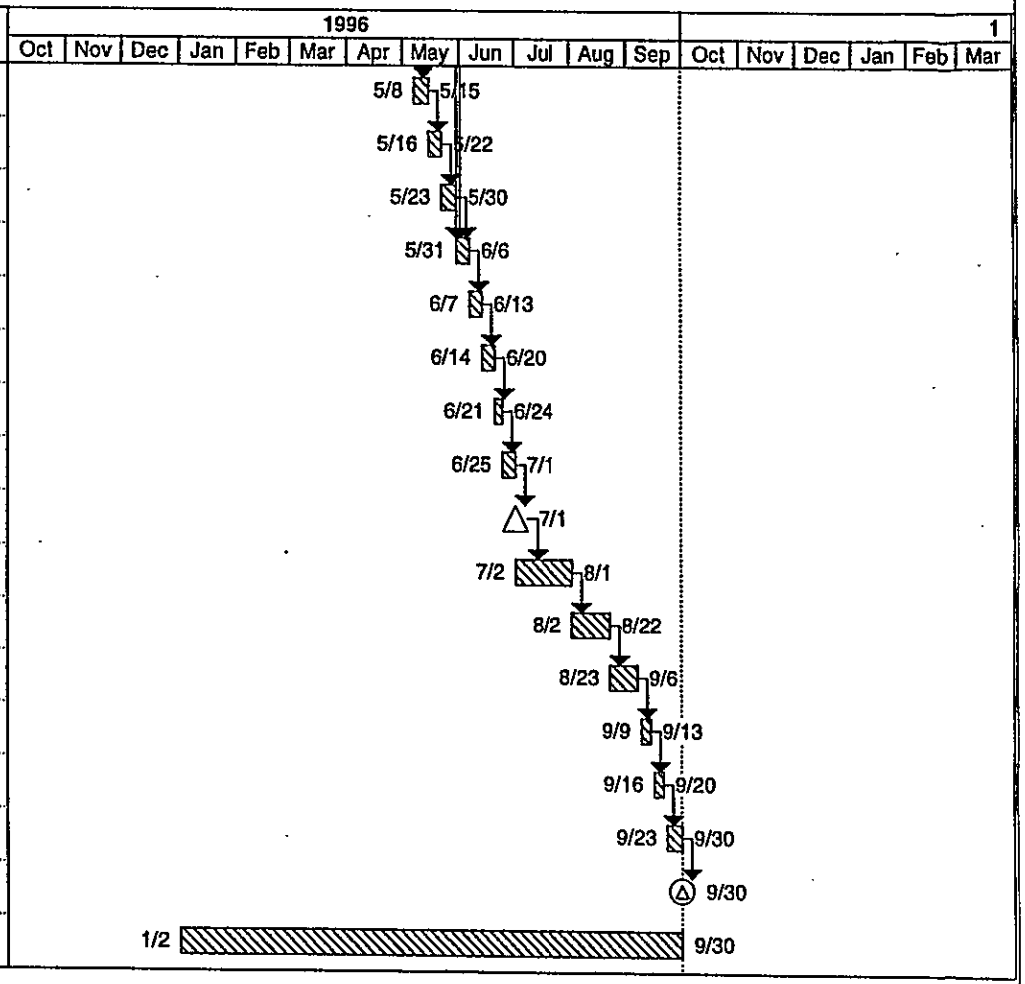
149	1.4.10.1.1.08.07.1.03. 060105-M	21309:05 - Publish Final Scoping Level Risk Assessment
150	1.4.10.1.1.08.07.1.03. 0602	Disseminate Information to Strategic Users



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Columbia River Comprehensive Impact Assessment
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Identifying Contaminants of Concern

Bruce Napier
Task Leader

Columbia River Comprehensive Impact Assessment Project
Pacific Northwest Laboratory

Project Objective

- Objective:Determine the current level of risk in the Columbia River due to all radioactive and hazardous substances released from the Hanford Site

- Current risk perspectives:

  -Human risk: evaluated for a range of exposure scenarios and river use options

  -Ecological risk: evaluated relative to the health of the river ecosystem

Topics for Discussion

- Why are we doing this?
- Where did we look?
- What did we look for?
- How did we do it?
- What did we decide?
- Where do we go from here?

Rationale for This Work

- Define level of detail available for Human and Ecological Risk Assessment
- Recognize existing remediation problems
- Identify other potential problems
- Focus project resources on areas of highest priority

Spatial Coverage

- Columbia River water and sediments
- 100, 300, 1100 Areas in particular
- Hanford soils and groundwater (outside operating areas) within 500 feet of the river
- Hanford groundwater farther than 500 feet from the river
- (Excluding buildings, tank farms, etc.)

Data Sources

- Recent (since 1980) sampling reports
  - Columbia River water and sediments
  - Seeps and springs
  - Discrete radioactive particles
  - Areas of increased external exposure
- RCRA groundwater monitoring reports
- HEIS - special query
- RI/FS and LFI reports
- Hanford Site environmental reports
- NEPA documents

Substances Looked For and Found

- Substances looked for:
  - 568 in surface water and groundwater
  - 560 in sediments and soils
- Substances found:
  - 73 in surface water and groundwater
  - 92 in soils and sediments
- Additional 20 substances found in groundwater plumes farther than 500 feet from river
- Many materials reported at background levels

Screening Approach

Human Risk

- Radionuclides
- Carcinogenic chemicals
- Non-carcinogenic, hazardous chemicals

Ecological Risk

- EPA Ambient Water Quality Criteria
- Aquatic biota toxicity

Input to each screen is the maximum concentration found in the reviewed literature

Screening Triggers

- Each screen evaluated independently; a positive result on any screen results in inclusion on the final list
- For radionuclides and carcinogens: results for over 95 percent of risk, above a cutoff of 10^{-6} **Presentation to be revised**
- For non-carcinogens and ecological contaminants: results with hazard indices greater than 0.1

Radionuclide Screen

Human exposure scenario is a variant of the Hanford Site Risk Assessment Methodology

- **External exposure to water and sediments**
- **2 liters/day drinking water consumption**
- **100 kilograms/year fish consumption**
- **Incidental consumption of sediments**

Uses EPA radionuclide Slope Factor for ingestion to provide a relative ranking value

Ranking values greater than 10^{-6} imply radionuclides of potential concern

Carcinogenic Chemical Screen

Human exposure scenario is a variant of the Hanford Site Risk Assessment Methodology

- **External exposure to water and sediments**
- **2 liters/day drinking water consumption**
- **100 kilograms/year fish consumption**
- **Incidental consumption of sediments**

Uses EPA Cancer Potency Factor for ingestion to provide a relative ranking value

Ranking values greater than 10^{-6} imply contaminants of potential concern

Hazardous Chemical Screen

Human exposure scenario is a variant of the Hanford Site Risk Assessment Methodology

- **External exposure to water and sediments**
- **2 liters/day drinking water consumption**
- **100 kilograms/year fish consumption**
- **Incidental consumption of sediments**

Uses EPA Chronic Oral Reference Dose to provide a relative ranking value

Ranking values greater than 1.0 imply contaminants of potential concern

Ambient Water Quality Screen

Compares measured or projected contaminant concentrations in river water to the EPA Ambient Water Quality Criterion

Ranking values greater than 1.0 imply contaminants of potential concern

Aquatic Biota Toxicity Screen

Compares measured or projected contaminant concentrations in river water with either

- Threshold limit for any observable effect
- 1% of the LC50 for small freshwater fish

Ranking values greater than 1.0 imply contaminants of potential concern

Screening Approach

Separate, consistent screening equations established for contaminants in

- **Columbia River water**
- **Groundwater**
- **River sediments**
- **Near-river soils**

Groundwater

$$C^{\circ}_{w} = C_{gw} * \frac{100}{100{,}000}$$

C°_{w} = the surrogate river water concentration used in the screen, pCi/L,

C_{gw} = the measured ground water concentration, pCi/L,

100 = the ground-water discharge rate, cfs,

100,000 = the approximate annual average flow rate of the Columbia River at Hanford, cfs.

Sediments

$$C^{\circ}_{w} = \frac{C_{sed} * 1000}{100{,}000}$$

C_{sed} = the sediment concentration, pCi/g,
1000 = a unit conversion, g/Kg,
100,000 = the assumed concentration ratio, L/Kg.

Near-River Soils

$$C^{\circ}_{w} = C_{soil} * \frac{(1000 * 1 * 100 * 0.01)}{100{,}000}$$

C_{soil} =	the concentration in soil, pCi/g,
1000 =	unit conversion, g/Kg,
1.0 =	assumption of soil/ground water concentration equivalency, kg/L,
100 =	the ground-water discharge rate, cfs,
0.01 =	fraction of total area contaminated, dimensionless,
100,000 =	the approximate annual average flow rate of the Columbia River at Hanford, cfs.

Other Potential Hazards Evaluated

- Discrete radioactive particles
- Dirrect irradiation from facilities
- Materials of public interest

Discrete Radioactive Particles

Small metallic chips (about 0.1 mm), probably from reactor internal parts

- **Contain 1 - 25 microcuries, mostly cobalt-60**
- **Found buried in rocky, flat areas with little vegetation on islands or in sloughs**
- **Exist downstream at least as far as Snake River confluence**

Direct Irradiation from Facilities

Dose rates above background reported near:

- **100-N Area**
- **100-K Area**
- **300 Area**

Low-level diffuse sources exist along Columbia River shorelines in Hanford Reach

Materials of Public Interest

Several materials are frequently asked about at public meetings, and public interest groups track specific contaminants

Many of these contaminants are not indicated by the screening process as being of priority for further evaluation

Several of these contaminants are included in the final list to ensure continued public information

Comments Received

- Include seeps/springs scenario
- Add irrigation/crop consumption to human screen
- Include impacts on fish eggs
- Do not eliminate contaminants based on EPA determination for humans only

- Include future impacts
- Include synergistic interactions

Contaminants of Interest Identified to Date

Surface Water, Sediment, Groundwater, and Soil Results	Plus Existing Groundwater Plumes farther than 500 feet from Columbia River	Plus Continued Public Interest
Antimony	Carbon Tetrachloride	Chloroform
Arochlor 1248 (PCB)	Fluoride	Cyanide
Arsenic		Iodine-129
Cesium-134		Plutonium-239/240
Cesium-137		Technetium-99
Chlordane		Trichloroethylene
Chromium*		Tritium (Hydrogen-3)
Cobalt-60/particles		Uranium
Copper		
Diesel Fuel		
Europium-152		
Europium-154		
Lead		
Manganese		
Mercury		
Nitrate/nitrite*		
Phosphorus/phosphate		
Silver Chloride		
Strontium-90		
Zinc		

In addition, direct irradiation and discrete particles were also identified as being of concern.

* Also identified by screening of groundwater plumes greater than 500 feet from Columbia River.